

# (12) UK Patent Application (19) GB (11) 2 092 437 A

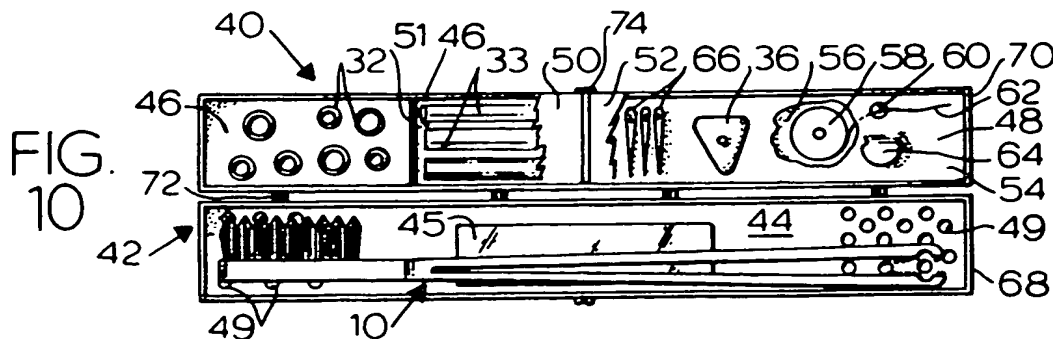
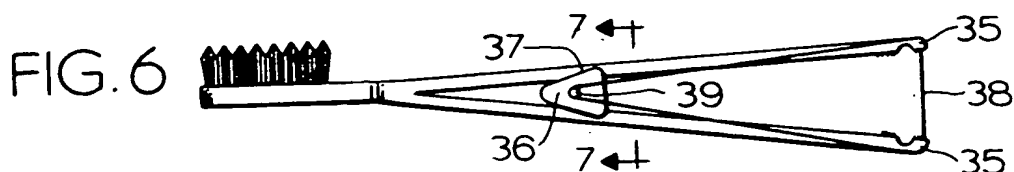
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 GB 0292055  
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 GB 0322494  
 GB 0293677  
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(54) Toothbrushes and dental hygiene kit

(57) A toothbrush 10, Figure 10 has a brushing end and a handle end. The handle end is divided into two prongs which are normally separated. The inside surface of each free end of the prongs has a grasping surface and grooves for holding orthodontic rubber bands and plastics needles. Guide means for securing dental floss are provided at the free ends of the prongs and a removable wedge 36, Figure 6 is employed to hold the prongs separated, providing tension for the dental floss.

A dental hygiene kit has a case with three compartments. A first compartment holds a toothbrush, a second holds orthodontic rubber bands 32 and strips of wax, and a third holds a replaceable spool of dental floss 58, a floss cutter 64 and plastics needles 66.



GB 2 092 437 A

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

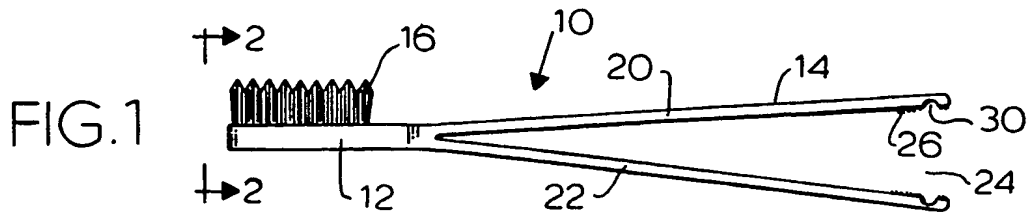


FIG.1

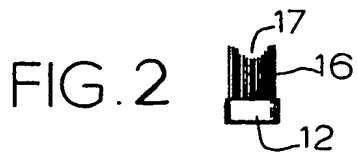


FIG. 2

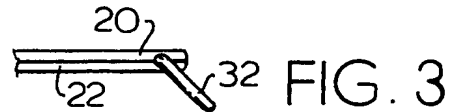


FIG. 3

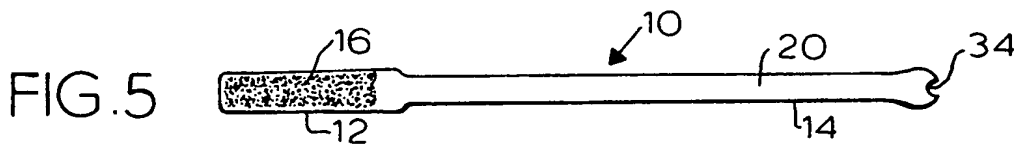


FIG.5

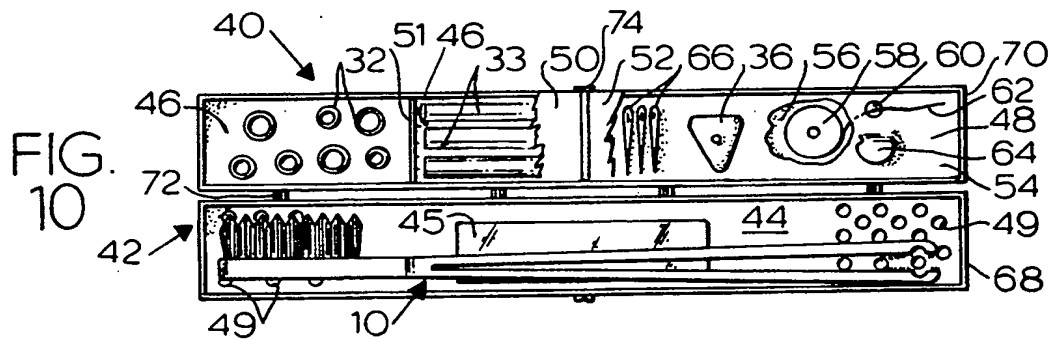


FIG.  
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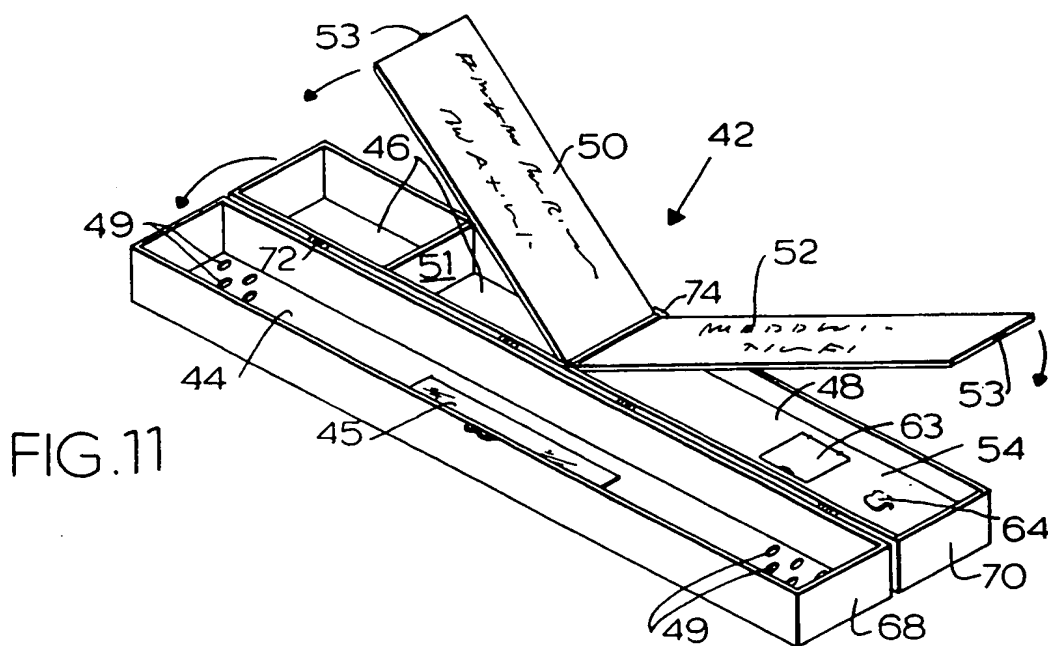
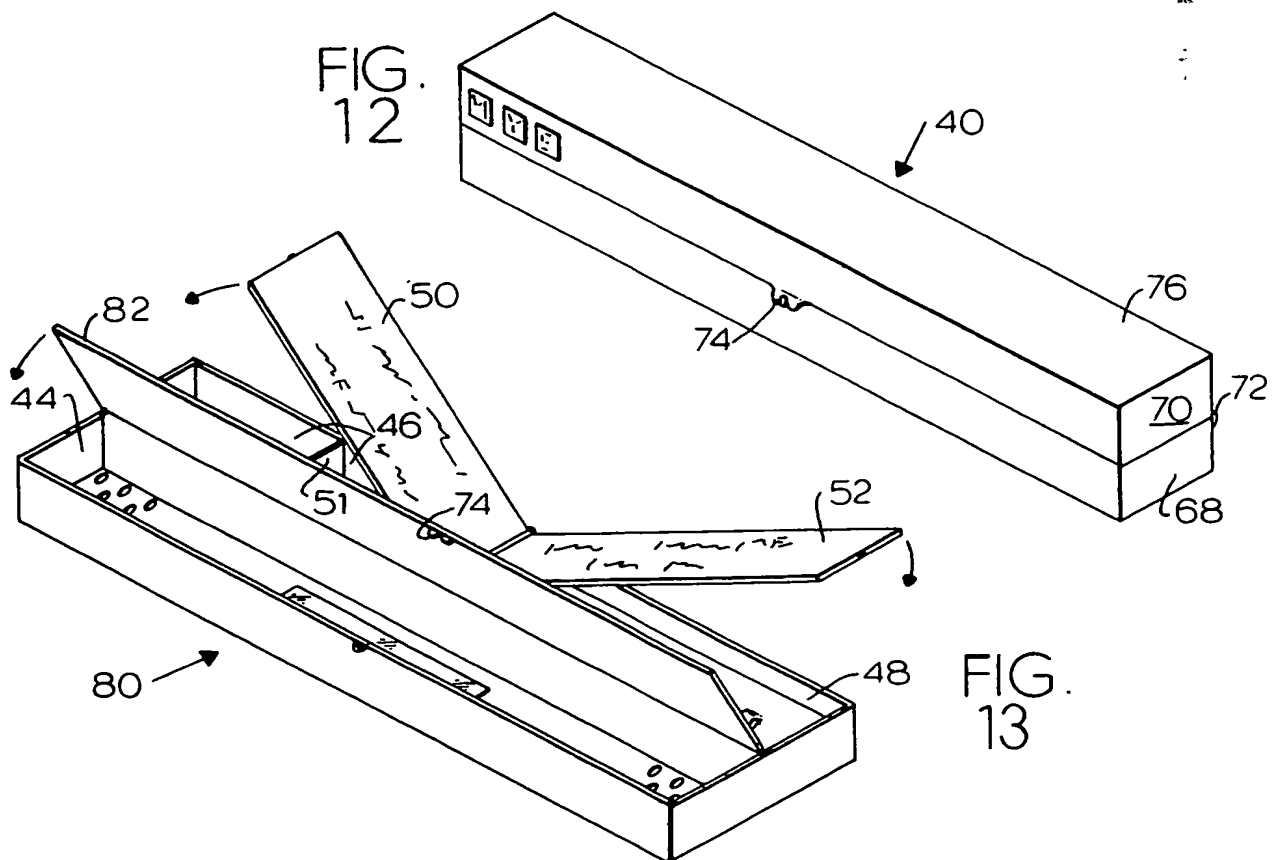
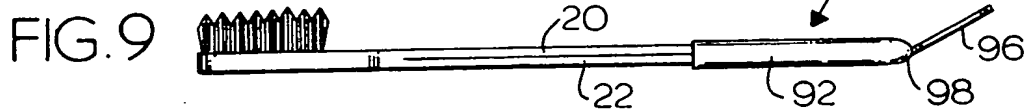
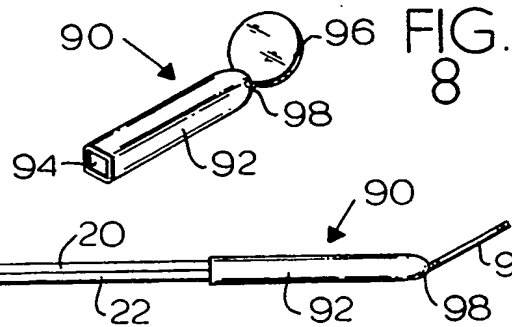
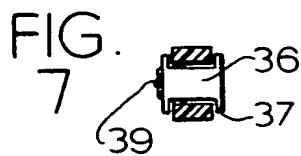
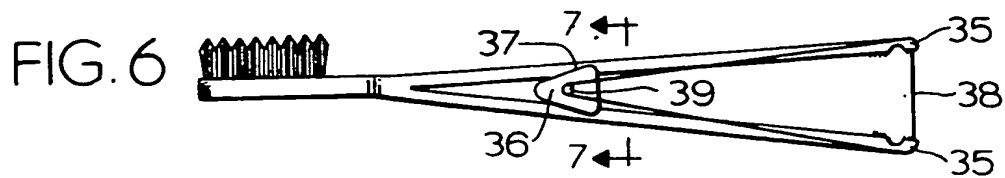
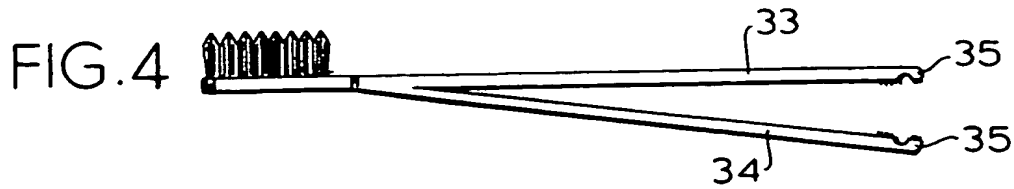


FIG.11



## SPECIFICATION

## Improvements in or relating to toothbrushes

- 5 This invention relates to toothbrushes, particularly to toothbrushes which are used by orthodonture patients. The invention also relates to a dental hygiene kit for such patients, and for bridgework patients.
- 10 Orthodontic dental treatment entails the use of metal braces which are attached to a patient's teeth; tension is applied to those braces in order to alter alignment of the teeth in order to correct abnormalities and/or to improve their function or appearance.
- 15 The pressure is typically provided by rubber bands which are stretched between parts of the braces in the direction where tension is desired. These rubber bands are typically manually inserted and removed from the mouth by the patient using the fingers,
- 20 although sometimes the patient's fingers are too large to fit far enough back in the mouth. When an orthodontist inserts a rubber band on the braces in a patient's mouth, a tweezer-like device is used to effect proper placement without the use of fingers
- 25 inside the mouth.
- Braces often present an obstacle to proper brushing, since food particles often lodge inside the braces at locations which are difficult to reach. Proper cleaning of the braces necessitates removal
- 30 and replacement of the rubber bands. These problems are similar to those experienced by patients who have bridgework; food particles often get stuck between the bridge and the patient's gum. This is more a problem for wearers of fixed prosthodontic
- 35 appliances than for wearers of removable bridge-work.
- One problem which has remained unsolved is that the patient will tend to forget or consciously omit replacing the rubber bands after brushing, unless
- 40 they are immediately available at that time. Many patients find it somewhat distasteful or unsanitary to insert their fingers in their mouths immediately after having brushed their teeth, and will therefore avoid replacing the rubber bands altogether. This tendency
- 45 not to replace rubber bands detracts from the effectiveness of orthodontic treatment, which depends on the consistent tension from the rubber bands to effect movement of the teeth.
- The problem of food becoming stuck in the braces,
- 50 as well as the problem of food becoming stuck under bridgework, has been largely eliminated by the use of plastic needles to guide strands of dental floss through the otherwise unreachable crevices of braces and bridgework. Here again, the remedy of
- 55 using floss is only effective when it is practised. Any circumstance, such as unavailability of rubber bands, dental floss, floss needles, a toothbrush, or the distastefulness of manually inserting rubber bands, will interfere with the regular practice of
- 60 proper oral hygiene and, therefore, interfere with the effectiveness of orthodontic, prosthodontic, and periodontic treatment.
- In the past, for example in U.S. Patents No. 2,284,217 and No.3,921,649, there have been tooth-
- 65 brush cases and kits designed to hold a toothbrush

- and also having a compartment for dental floss and/or for toothpaste, but these prior art cases and kits do not address the oral hygiene problems of orthodonture patients. These patients need to have
- 70 not only a toothbrush and floss, but also require rubber bands, wax, and plastics needles, as well as an improved alternative for inserting the rubber bands and manipulating the plastic needles. Wearers of fixed prosthodontic appliances also require
- 75 assistance in manipulating the floss-guiding plastics needles between the bridgework and their gums.
- There have been other earlier devices, such as U.S. Patents No.1,792,429 and No.2,468,298 wherein a floss applicator has been associated with the
- 80 handle of a toothbrush, but these devices could not be used to help orthodonture patients with placement of rubber bands. These devices were also of no aid to prosthodontic patients for threading dental floss under bridgework.
- 85 It has, therefore, been a problem to provide all the necessary implements, in one place, for a patient to practise proper dental hygiene while wearing tensioned braces or bridgework. Another problem has been the reluctance of patients to insert their fingers
- 90 in their mouths to replace rubber bands and for flossing.
- It is an object of this invention to overcome or at least mitigate some or all of the above disadvantages.
- 95 According to one aspect of this invention there is provided a toothbrush, comprising: a brushing end having a plurality of bristles disposed on a top surface thereof and extending away from the brushing end; and a holding end unitary with the
- 100 brushing end and forming grasping means for holding orthodontic rubber bands, plastics needles and the like, and for inserting rubber bands.
- Preferably the holding end comprises two prongs, each having a free end, the prongs being joined
- 105 together adjacent the brushing end, and being biased apart and adapted to be manually compressed towards each other for holding orthodontic rubber bands, plastics needles and the like.
- Conveniently one said prong is inclined upwardly
- 110 in the direction of said bristles and the other said prong is inclined downwardly in the direction opposite to that of the said bristles.
- Suitably each said prong has an internal side closest to the other said prong, and an external side
- 115 farthest from said other prong, the internal side adjacent the free ends of each prong having friction means to facilitate grasping of orthodontic rubber bands, plastics needles, and the like. Advantageously each said friction means comprises a shallow
- 120 groove, the grooves being so located as to meet each other when the prongs are compressed together, for holding and inserting orthodontic rubber bands. Preferably the free end of each said prong has a shallow channel running from the internal side
- 125 of the prong to the external side of the prong, the channels being adapted to hold a strand of dental floss taut between the prongs, a removable wedge member being inserted between the prongs to urge them apart for holding a strand of dental floss taut
- 130 across the open end of the prongs. The free ends of

the prongs may be curved to aid with flossing.

Conveniently a longitudinal central area of the free tips of the bristles is recessed with respect to the remainder of the free tips of the bristles for better contact around braces and with the gums.

According to a second aspect of this invention there is provided a dental hygiene kit comprising: a case; a first closable compartment in the case adapted to store a toothbrush, the bottom of the first compartment having a plurality of holes to allow moisture to escape; a toothbrush disposed in the first compartment; a second compartment in the case having a movable cover and being adapted to store orthodontic rubber bands and wax; a plurality of orthodontic rubber bands and strips of orthodontic wax disposed in the second compartment; a third compartment in the case having a movable cover, and being adapted to store a replaceable spool of dental floss and plastics needles for threading dental floss through orthodontic braces and bridgework, the said third compartment having cutting means for cutting off desired lengths of dental floss; a replaceable spool of dental floss disposed in the third compartment; and a plurality of plastics needles disposed in the third compartment.

Preferably the said third compartment comprises a removable bottom having an opening therethrough and dividing the third compartment into an upper section and a lower section, the said replaceable spool of dental floss being disposed in the lower section, a free end of the dental floss extending through the said opening, the said cutting means being associated with the removable bottom, and the said plastics needles being disposed in the upper section.

Conveniently the said opening in the removable bottom comprises a door through which the spool of dental floss may be replaced.

Advantageously the cover of the third compartment has clip means for securing the plastics needles, the clip means being disposed on the inside of the said cover.

Suitably, the toothbrush of the kit is in accordance with the first aspect of the invention.

Preferably the kit further comprises a mirror attachment.

Conveniently the mirror attachment is located within the said first compartment. Suitably the mirror attachment comprises: a sleeve having a rectangular opening at one end and a mirror attached at an angle at the other end, the sleeve being adapted to fit over the holding end of the toothbrush.

Advantageously the said second compartment has a centre wall dividing it into two sections, a first said section being adapted to store the orthodontic rubber bands, and a second said section being adapted to store the strips of orthodontic wax.

According to a third aspect of this invention there is provided a toothbrush case comprising: a first section having a first compartment adapted to store a toothbrush, the bottom of the said first compartment having holes to allow moisture to escape therefrom; movable cover means associated with the said first compartment; a second section having

a second compartment and a third compartment, the said second compartment having a movable cover and being adapted to store orthodontic rubber bands and orthodontic wax, and the said third compartment having a movable cover and being adapted to store a replaceable spool of dental floss and plastics needles for threading dental floss through orthodontic braces and prosthodontic bridgework, the said third compartment having cutting means for cutting off desired lengths of dental floss.

Preferably the first section and the second section are connected together by a hinge, the arrangement being such that the covers of the second and third compartments constitute at least part of the said movable cover means associated with the first compartment when the first section and the second section are closed together on the said hinge.

So that the invention may be more readily understood and so that further features may be appreciated, various toothbrushes in accordance with the invention and associated dental hygiene kits will now be described by way of example and with reference to the accompanying drawings, in which: *Figure 1* is a schematic view in side elevation of a toothbrush in accordance with the present invention;

*Figure 2* is an end view of the toothbrush of *Figure 1*, taken along line 2-2 in *Figure 1*, illustrating a recessed centre bristle section;

*Figure 3* is a sectional view in side elevation of the grasping end of the toothbrush of *Figures 1* and *2* shown with the prongs pressed together, illustrating a rubber band being held in aligned grooves;

*Figure 4* is a schematic view in side elevation of another toothbrush in accordance with the present invention, intended to be held only by the upper prong for brushing;

*Figure 5* is a top plan view of the toothbrush shown in *Figure 1*, illustrating end channels;

*Figure 6* is a schematic view in side elevation of a toothbrush in accordance with the invention, illustrating an embodiment with a removable wedge for use as a dental floss applicator.

*Figure 7* is a sectional view taken along line 7-7 in *Figure 6*, illustrating the removable wedge in place between the prongs of the toothbrush.

*Figure 8* is a top front perspective view of a dental mirror attachment, to be slid over the end of the closed prongs of a toothbrush in accordance with the invention;

*Figure 9* is a schematic view in side elevation of a toothbrush in accordance with the invention, with the dental mirror attachment of *Figure 8* in place;

*Figure 10* is a top plan view of a container for a toothbrush in accordance with the invention, the compartment covers thereof having been broken away to illustrate complementary oral hygiene implements, a portion of one compartment floor being partially broken away to illustrate the location of a replaceable spool for dispensing floss, placed beneath a false bottom in the compartment;

*Figure 11* is a top right perspective view of the container of *Figure 10*, the implements of the kit having been removed, and the compartment doors

being opened to illustrate the construction of the container;

*Figure 12* is a top right perspective view of the container of Figures 10 and 11, shown with its two hinged sections closed together, and

*Figure 13* is a top right perspective view of another container, having a separate cover for the toothbrush compartment and no hinge.

Figures 1 to 9 illustrate aspects of a toothbrush in accordance with the invention. The toothbrush 10 shown in Figure 1 has a head or brushing end 12 and a handle or holding end 14. The brushing end 12 has a series of bristles 16 extending upwardly from its top, preferably in rows defining an arrangement which is V-shaped in cross-section. While a normal flat set of bristles may be used, it is preferred that the longitudinal central area 17 of the free tips of the bristles be recessed from the rest, as shown in Figure 2. This recessed area 17 facilitates better contact with both braces and teeth, by accommodating the raised area of the braces without requiring additional pressure to touch the teeth when brushing. The recessed area 17 also facilitates getting into the sulcus of the gingival tissues, in order to prevent periodontal disease of the teeth and gums surrounding prosthetic work. The handle end 14 is formed by two longitudinal prongs 20 and 22 respectively, extending from a common segment of the head end 12 in a direction away from the head end, to form tweezers.

The prongs 20 and 22 are normally separated, as illustrated in Figure 1, at 24 and are adapted to be manually pressed towards each other for holding objects such as orthodontic rubber bands and periodontic needles. The inside opposed tip surfaces 26 of the prongs 20, 22 are provided with serrations 28 or are otherwise roughened to enhance the gripping quality of the tweezers. Two opposed transverse grooves 30 in the inside tip surfaces 26 are aligned so that they meet when the prongs 20 and 22 are manually closed. The grooves 30 are adapted and disposed for conveniently holding an orthodontic rubber band 32, as illustrated in Figure 3, for insertion onto the braces in a patient's mouth without inserting fingers in the mouth.

Figure 4 illustrates an embodiment where a toothbrush 10 may be held by only a top prong 33 of the handle end for brushing, as if it were an ordinary toothbrush. The top prong 33 extends in a common plane with the brushing end 12. A lower prong 34 is angled downwardly and can be pressed together with the top prong 33 for holding orthodontic rubber bands and prosthodontic plastic needles.

As shown in Figure 5, in an embodiment adapted for using the handle end 14 as a dental floss applicator, a respective channel 34 may be provided vertically across the free end of each prong 20 and 22. As illustrated in Figures 6 and 7, a wedge shaped member 36 may be inserted between the prongs 20 and 22 to spread them and hold them open. The wedge 36 has protruding side members 37 to hold it securely between the prongs 20 and 22. The wedge 36 may also be used to secure a strand of dental floss 38, either on securing means 39 or by wedging the floss between the wedge 36 and the prongs 20 or

22, so that the floss may be held taut between the free ends of the prongs 20 and 22. The floss is held in the channels 34 to keep it in place across the spread prongs 20 and 22 as shown in Figure 6. The free ends of the prongs are curved to assist flossing.

Figures 8 and 9 illustrate a dental mirror attachment 90 which may be slid over the free ends of the prongs 20, 22 when they are closed together. The mirror attachment has an attachment sleeve 92 having a rectangular opening 94 to accommodate the prongs 20 and 22 of the toothbrush 10. A mirror 96 is connected at an angle, preferably of 33°, to the closed end 98 of the sleeve 92.

Figures 10 and 12 show a dental hygiene kit 40 in accordance with one aspect of the invention for use by orthodontic, prosthodontic or periodontic patients. The kit 40 comprises a container 42, having a first compartment 44, a second compartment 46, and a third compartment 48. The first compartment 44 is rectangular and sufficiently deep to store the toothbrush 10 described above, as shown in Figure 10. The first compartment 44 is provided with holes 49 at both ends to allow moisture to escape when a wet toothbrush is put in the container 42. The dental mirror attachment 90 may also be stored in the first compartment 44, and a small mirror may be attached to the floor of the compartment. The second compartment 46 and the third compartment 48 are also rectangular, but each is shorter than the first compartment 44. The second compartment has a releasable top cover 50 (Figure 11) and has spaces for storing orthodontic rubber bands 32 and orthodontic wax 33, which is usually in the form a cylindrical strip, approximately 6 mm in diameter. The wax is used to cover any areas of the bracework which are temporarily irritating the mouth. The second compartment may be divided by a wall 51 to provide respective separate spaces for the wax and rubber bands. The top cover 50 may be provided with raised lettering saying "RUBBER BANDS AND WAX". The third compartment 48 also has a releasable cover 52 which may be provided with lettering saying "FLOSS AND NEEDLES" or a similar description of the compartment's contents, and has a false bottom 54 which is removable to expose a bottom compartment 56 which is adapted to house a replaceable spool 58 of dental floss 62, as illustrated in the broken-away section of Figure 10. The false bottom 54 is provided with an opening 60 through which the free end of the dental floss 62 extends and is dispensed. Alternatively, the false bottom 54 may have a door 63 (shown in Figure 11) which opens for replacing the spool 58 of dental floss. The door 63 may be used in lieu of the opening 60 for dispensing the free end of the dental floss. The false bottom 54 is provided with a cutter 64 for severing desired lengths of dental floss. The floor of the third compartment 48 is adapted to store a plurality of plastics needles 66, which are used by the patient to guide dental floss through small openings in braces and bridgework. Alternatively, the plastics needles 66 may be secured by a clip (not shown) provided on the underside of the third compartment cover 52. The wedge member 36 may also be stored in the third compartment 48. Latches 53 may be provided

for holding the releasable covers 50 and 52 closed.

In a preferred embodiment, best illustrated in Figures 10, 11 and 12, the first compartment forms a first section 68 of the container 42, and the second and third compartments 46 and 48 form a second section 70 of the container. The first section 68 and the second section 70 of the container 42 are of equal size and are connected together by a hinge 72 so that they may be closed together to hold the toothbrush 10 inside the container 42 and prevent dirt from getting in. The covers 50 and 52 also act to hold the toothbrush 10 in place in the first compartment 44 when the container 42 is closed. Lock means 74 may be provided for holding the container 42 closed.

In another embodiment, shown in Figure 13, container 80 is unhinged, and is otherwise identical to the embodiment of Figure 11, except that a releasable cover 82 is provided for the first compartment 44 to hold the toothbrush 10 in and to keep dirt out. The other elements of the dental hygiene kit may also be stored in this embodiment.

The preferred material for the toothbrush 10 and the container 42 is moulded plastic. The compartments may be labelled with raised letters moulded into the respective covers, and the outside may also have recessed spaces for a monogram or the owner's name.

#### CLAIMS

1. A toothbrush, comprising: a brushing end having a plurality of bristles disposed on a top surface thereof and extruding away from the brushing end; and a holding end unitary with the brushing end and forming grasping means for holding orthodontic rubber bands, plastics needles and the like.
2. A toothbrush according to claim 1 wherein the holding end comprises two prongs, each having a free end, the prongs being joined together adjacent the brushing end, and being biased apart and adapted to be manually compressed towards each other for holding orthodontic rubber bands, plastics needles and the like.
3. A toothbrush according to claim 2 wherein one said prong is inclined upwardly in the direction of said bristles and the other said prong is inclined downwardly in the direction opposite to that of the said bristles.
4. A toothbrush according to claim 2 or 3 wherein each said prong has an internal side closest to the other said prong, and an external side farthest from said other prong, the internal side adjacent the free ends of each prong having friction means to facilitate grasping of orthodontic rubber bands, plastics needles, and the like.
5. A toothbrush according to claim 4 wherein each said friction means comprises a shallow groove, the grooves being so located as to meet each other when the prongs are compressed together.
6. A toothbrush according to claim 4 or 5 wherein the free end of each said prong has a shallow channel running from the internal side of the prong to the external side of the prong, the channels being

adapted to hold a strand of dental floss taut between the prongs, a removable wedge member being inserted between the prongs to urge them apart.

7. A toothbrush according to any one of the preceding claims wherein a longitudinal central area of the free tips of the bristles is recessed with respect to the remainder of the free tips of the bristles.

8. A hygiene kit comprising: a case; a first closable compartment in the case adapted to store a toothbrush, the bottom of the first compartment having a plurality of holes to allow moisture to escape; a toothbrush disposed in the first compartment; a second compartment in the case having a movable cover and being adapted to store orthodontic rubber bands and wax; a plurality of orthodontic rubber bands and strips of orthodontic wax disposed in the second compartment; third compartment in the case having a movable cover and being adapted to store a replaceable spool of dental floss and plastics needles for threading dental floss through orthodontic braces and bridgework, the said third compartment having cutting means for cutting off desired lengths of dental floss; a replaceable spool of dental floss disposed in the third compartment; and a plurality of plastics needles disposed in the third compartment.

9. A dental hygiene kit according to claim 8 wherein the said third compartment comprises a removable bottom having an opening therethrough and dividing the third compartment into an upper section and a lower section, the said replaceable spool of dental floss being disposed in the lower section, a free end of the dental floss extending through the said opening, the said cutting means being associated with the removable bottom, and the said plastics needles being disposed in the upper section.

10. A dental hygiene kit according to claim 9 wherein the said opening in the removable bottom comprises a door through which the spool of dental floss may be replaced.

11. A dental hygiene kit according to any one of claims 8 to 10 wherein the cover of the third compartment has clip means for securing the plastics needles, the clip means being disposed on the inside of the said cover.

12. A dental hygiene kit according to any one of claims 8 to 11 wherein the said toothbrush is a toothbrush according to any one of claims 1 to 7.

13. A dental hygiene kit according to any one of claims 8 to 12 further comprising a mirror attachment.

14. A dental hygiene kit according to claim 13 wherein the mirror attachment is located within the said first compartment.

15. A dental hygiene kit according to claim 13 or 14 wherein the mirror attachment comprises a sleeve having a rectangular opening at one end and a mirror attached at an angle at the other end, the sleeve being adapted to fit over the holding end of the toothbrush.

16. A dental hygiene kit according to any one of claims 8 to 15 wherein the said second compartment has a centre wall dividing it into two sections, a first said section being adapted to store the orthodontic

rubber bands, and a second said section being adapted to store the strips of orthodontic wax.

17. A toothbrush case comprising: a first section having a first compartment adapted to store a  
5 toothbrush, the bottom of the said first compartment having holes to allow moisture to escape therefrom; movable cover means associated with the said first compartment; a second section having a second  
10 second compartment having a movable cover and being adapted to store orthodontic rubber bands and orthodontic wax, and the said third compartment having a movable cover and being adapted to  
15 store a replaceable spool of dental floss and plastics needles for threading dental floss through orthodontic braces and prosthodontic bridgework, the said third compartment having cutting means for cutting off desired lengths of dental floss.

18. A toothbrush case according to claim 17  
20 wherein the first section and the second section are connected together by a hinge, the arrangement being such that the covers of the second and third compartments constitute at least part of the said  
25 movable cover means associated with the first compartment when the first section and the second section are closed together on the said hinge.

19. A toothbrush substantially as herein described with reference to, and as shown in, Figures 1  
30 to 3 of the accompanying drawings.

20. A toothbrush substantially as herein described with reference to, and as shown in, Figure 4  
of the accompanying drawings.

21. A toothbrush substantially as herein described with reference to, and as shown in, Figure 5  
35 of the accompanying drawings.

22. A toothbrush substantially as herein described with reference to, and as shown in, Figures 6  
and 7 of the accompanying drawings.

23. A toothbrush substantially as herein described with reference to, and as shown in, Figures 8  
40 and 9 of the accompanying drawings.

24. A dental hygiene kit substantially as herein described with reference to, and as shown in Figures  
10 to 12 of the accompanying drawings.

25. A dental hygiene kit substantially as herein described with reference to, and as shown in Figure  
45 13 of the accompanying drawings.

26. A toothbrush case substantially as herein described with reference to, and as shown in,  
50 Figures 10 to 12 of the accompanying drawings.

27. A toothbrush case substantially as herein described with reference to, and as shown in, Figure  
13 of the accompanying drawings.

28. Any novel feature or combination of features  
55 disclosed herein.